

RECURRENCE OF HYDROCELE AFTER RADICAL TREATMENT.

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Ten years ago the radical treatment of hydrocele was *res judicata*. Eversion and total resection shared the favors of surgeons.* To resection were assigned the relatively rare cases of symptomatic vaginalitis and chronic pachyvaginitis. All other varieties were treated by eversion. Of late, however, the advantages claimed for eversion have been questioned, numerous recurrences being reported after its use. Hence a return to the so-called method of total resection of the tunica vaginalis, which our German friends persist in calling Bergmann's operation, although it was practiced by Celsus, Albucassis, Ambroise Paré, Dupuytren and others.

An extensive personal experience with eversion and a careful study of many published cases of recurrence following this operation have convinced me that the great majority of said failures were due to (1st) errors in technic; (2nd) errors in the choice of the operative procedure. The further elucidation of these statements is my excuse for the present causerie.

In the operation of eversion as originally performed by Vautrin, Doyen and subsequently Winkelmann, no attempt was made to approximate the edges of the everted serosa. The frequency of recurrence soon reported from all sides led Legueu and Jaboulay to stitch the edges of the everted tunica as high as possible around the cord by means of two or three catgut sutures. Even then the redundant serosa would occasionally get free, sagging in the direction of the testis, the folds of the serosa adhering to each other, producing small pockets, thus inviting recurrence.

Longuet (1900) perfected and simplified the operation of eversion by doing away entirely with all dissection, omitting the delivery of the tumor and making a new bed for the testicle.

Under local anesthesia, a transverse fold of the scrotum over the testicle is taken up and cut with the scissors down to the serosa which is immediately taken up and cut in like manner. Neither incision should exceed three or four cm. By means of pressure from behind the testicle is made to escape from its serous sac. It is then lifted upward and forward between two fingers, avoiding traction on the cord which will invariably give rise to pain and nausea.

The different scrotal layers (tunica and overlying fibrocellular tissue) will be seen to retract in the direction of the cord, the posterior surface of which comes directly into view. Note that there has been no dissection, no delivery of the tumor.

The edges of the everted tunica are stitched together by means of two or three catgut sutures passing through the cellular tissue of the posterior surface of the cord. The testicle is not replaced in its original position, but a new bed is provided

for it in the middle of the inner edge of the incision, by inserting both index fingers into the loose connective tissue adjoining the raphé and then rapidly separating them a distance of five or six cm. This step is generally painless; it is always bloodless. The testicle is then carefully dropped into the resulting cavity, which is inside of and parallel to the old cavity. In its new position the testicle is slightly twisted on its axis, being in retro-lateral version instead of in normal antero-version. The scrotal wound is closed by means of Michel staples or with a Cushing stitch.

It is uncommon to keep the patient in bed after the first day; indeed, I have seen patients walk home two hours after this operation and resume work the next day. With a properly fitted suspensory the resulting local reaction is habitually insignificant. Mobility of the testicle may be noticed as early as the third day. It is almost invariably present at the time of removal of the staples. Close examination will then show an anterior attachment to the testicle.

My sole excuse for referring in detail to a procedure already thoroughly discussed in a previous publication is the desire to show that the modifications of a good operation have caused the majority of recurrences noted in recent surgical literature.

Recurrences may be divided into three groups. In the first small group, the operation of eversion was done without securing the everted tunica. A mere reference to surgical literature would have prevented such a mistake. In the second group, by far the most numerous, the operation differed from that of the preceding group in one unimportant point: the opening in the tunica was smaller; but here again no suturing was done. This constitutes the widely heralded Andrews' bottle operation, which its author in 1907 and again in 1912 (*Keen's Surgery*, Vol. IV) recommended without reserve and urged "that it supersede all other operations for hydrocele."

In his original article (*Annals of Surgery*, December, 1907), Andrews paid no attention to the development of the operation of eversion and ignored all the publications on this subject for the preceding six years.

In the bottle operation there are two errors of technic; (1st) the delivery of the sac is a totally unnecessary procedure; it may cause hemorrhage and always prolongs the patient's rest in bed; (2nd) the failure to stitch the everted tunica predisposes to recurrence through the sagging of the serosa, which brings the secreting serous surfaces together, forming pockets or even reproducing the original hydrocele.

The latter condition I have actually seen in operating a recurring hydrocele in which the bottle operation had been done two months previously. I had noticed a similar state of affairs in one of my cases in 1899 when eversion was practiced without stitching the everted serosa.

Recurrences after the bottle operation were reported by Eastern surgeons several years ago (Lyle, Moschowitz, etc.), and of late the list of failures seems to be increasing.

In the third group of recurrences after eversion

* I firmly believed that the injection method had been relegated to history; recently, however, I learned that it still constitutes the treatment of choice at one of our local teaching hospitals.

are the cases of hydrocele due to subacute infections, tuberculosis of the epididymis, chronic pachyvaginitis. Eversion failed me in two cases belonging to this group (one unknown infection and one tuberculosis), but it succeeded admirably in several cases of pachyvaginitis.

Experience, however, has proved the superiority of excision in the majority of hydroceles belonging to this group. Recurrence after the so-called total excision of the tunica was reported by Boyer in the latter part of the 18th century. This is easily understood when one remembers the anatomy of the region: the testicle lies outside of the closed serous sac; consequently, in the so-called total excision, that part of the tunica covering the testicle is left untouched, and may, under certain pathological conditions, continue to excrete, just as a cyst in any part of the body may reproduce itself after accidental tearing has occurred during its removal.

It was the latter consideration that led Bartlett, the clever St. Louis surgeon, to advocate the excision of the unopened hydrocele thus disposing of every particle of the excreting surface. Bartlett described his procedure in 1909, as follows: "After turning out the sac in the ordinary manner it is easiest to begin its removal at the spermatic cord; the loose tissue connecting these two structures can readily be separated by blunt dissection, as can the tumor from the testicle everywhere except at its lateral reflections from that organ, where some cutting must be done. No fluid need be lost and one will be surprised at the ease and quickness with which the dissection can be accomplished. Some small vessels will have to be ligated."

I have never performed this operation, and I know of no one who has resorted to it in other than thin wall hydroceles, that is to say, in the class of cases where it is unnecessary—a cure generally following a much simpler and safer procedure: eversion. Conservatives have accused the radical treatment of hydrocele of having caused a long list of disorders (epididymitis, testicular sclerosis, atrophy, sterility, dystrophy). Clinical and post-mortem experience have apparently ruled out all of these claims.

According to Charrin, Moussu, LePlay and Corpéchat, Ancel and Villemain, the role of the serosa is not merely mechanical; it has a trophic influence on the subjacent organ. From their experiments on sheep and guinea pigs they conclude that eversion or excision of the tunica invariably leads to marked interstitial and peripheral testicular hyperplasia, fatty degeneration and atrophy of the seminiferous tubes. As proof, however, that infection played a very important part in these experiments the following may be cited:

1. The presence of testicular adhesions even as late as a year after the experiment.
2. The predominance of the areas of atrophy on the surface of the testicle.

Hermann, after some very faulty experiments, concludes that the reaction following the radical treatment of hydrocele habitually causes the loss of the testicle, "although regeneration may take place."

From my own animal experiments I am con-

vinced that the protective role of the tunica vaginalis, like that of other serous membranes, has been greatly overestimated. Among the results of these experiments (eversion, resection, injection of irritants), the following are of interest:

1. Infection of the tunica is invariably followed by a marked change in the testicle; reduction in size, sclerosis and peripheral areas of atrophy.

2. Under strictly aseptic conditions eversion is not followed by atrophy of the testicle; the adhesions that occur between the testicle and the surrounding cellular tissue generally disappear within a few weeks when the testicle becomes free and normally movable as if within a new cavity. A peritesticular sclerosis is invariably present; there is a thickening of the albuginea, but the sclerosis does not extend into the parenchyma or involve the epididymis or the vas.

3. The testicular sclerosis is not more marked after eversion than following the injection of irritants into the tunica; it is frequently less pronounced.

4. Excision of the tunica gives rise to more marked testicular reaction than does eversion.

5. That the function of neither the interstitial nor the spermatogenic cells is affected by bi-lateral eversion of the tunica vaginalis is sufficiently proved by the total absence of developmental abnormalities in and the multiplication of puppies after said operation.

6. It would seem, nevertheless, that the testicle is no exception to the law of general pathology relating to the creation of points of lessened resistance by traumatism or infection.

CONCLUSIONS.

1. Although eversion is only a palliative measure and does not reach the determining factor, it will, when properly performed, prove eminently satisfactory in over 90% of hydroceles. The medium size, thin wall, chronic hydroceles are the most favorable for eversion.

2. Longuet's method of eversion, *without delivery of the sac*, is the simplest, safest, and least liable to recurrence. It frequently succeeds even in very thick wall hydroceles. A few symptomatic hydroceles recur after eversion.

3. Recurrence frequently results from failure to stitch the edges of the everted tunica vaginalis.

4. Andrews' bottle operation is a failure; it is a step backward in the history of the therapeutics of hydrocele, and its adoption accounts for a large proportion of the recurrences noted in this country.

5. Excision is preferable to eversion in the rare cases of chronic pachyvaginitis. The so-called total excision of the tunica vaginalis is not total, and recurrences following its use have been reported.

6. Excision of the unopened hydrocele is the only complete method of removing the entire excreting surface. It has not been resorted to in thick walled hydroceles; in thin wall hydroceles it is an unnecessarily complicated procedure.

7. Of the numerous objections made by conservatives to the radical treatment of hydrocele

none resists either a thorough clinical or the experimental test.

8. The protective role of the tunica vaginalis has been overestimated.

9. Under strictly aseptic conditions experimental eversion of the tunica is not followed by atrophy of the testicle; it may produce a mild peritesticular sclerosis.

Discussion.

Dr. R. L. Rigdon: The paper of Dr. Tait does not leave much to be said in the way of discussion for it has covered the ground so thoroughly that but little can be added to it. The best that I can do is to simply mention some personal experiences that I have had with the operations for hydrocele, and none of these experiences are out of the usual. As a rule hydroceles are so easily taken care of that we do not consider them at all seriously; they are easily disposed of in one or other of the ways known to us. Years ago, when Keyes proposed as a remedy the injection of carbolic acid, he stated that it was a painless method and that the patient could go away from the office after the injection without being confined to bed. I was much impressed by his reports and began to use the injection method. At first I was afraid to use carbolic acid in quantities sufficient to produce the desired results, but having gained confidence, I used more acid, was more careful in the technic and the results were satisfactory. So far as I know, there has been but one untoward result, and that occurred years ago in an old man. In this instance sloughing of the scrotum occurred. I always felt that it was my fault rather than that of the operation, because it was employed in an unsuitable case. In properly selected patients the results will be satisfactory. At the clinic, if we desire to employ the injection method, we draw off the fluid, inject the acid and send the patient home. We have him return the next or the following day and draw off any inflammatory effusion that may have occurred. I now recall no failures to cure, but I realize that failures may occur.

With reference to the matter of eversion of the testicle, one has to do that operation but once or twice to realize that something more than opening the sac is necessary; the work must be seasoned with a little surgical judgment. If the sac is not opened high enough but a closed space is left at the upper portion, this may readily refill. A specimen procured for me by Dr. Howard Somers illustrates a condition that is sometimes present and which if overlooked might give rise to recurrence. I refer to the little pockets that may be found between the epididymis and the testicle. Occasionally these are quite large and the opening into them is small and after the eversion operation these pockets might close and form cysts in which reaccumulation of fluid would take place. Ordinary judgment would indicate that if the sac were large it is good surgery to cut off a large part of it. The hemorrhage that occurs is very easily controlled. In connection with trimming the sac off, unless one is careful one might cut uncomfortably close to the vas deferens but this mishap need not occur if one will bear it in mind. I have had no personal experience in transplanting the testicle but we know that it can be done without injurious results. As to the effects of the various operations on the function of the testicle, I think they are nil.

Dr. M. Krotoszyner: Unfortunately I was too late to listen to Dr. Tait's paper, but I recall a previous paper of his, in which he said that the eversion method for hydrocele can be easily done so that the patient can get up within two days after operation. I cannot verify this by my results; it takes, in my own work, about a week

before the patient is up and about. As regards the operative treatment of hydrocele I think it is wisest to offer the patient, at the present stage of our knowledge, the radical operation, which consists in either excision of the tunica—after Volkmann, or the eversion of the tunica around the cord after Winkelmann. In those cases where the tunica is much thickened and diseased I have held to the first procedure as the better method. In those instances, though, where the tunica was only moderately diseased, I have resorted to a combination of both methods of everting the tunica after removing part of it and stitching the cut-edges around the cord. I have followed a good many of my cases as regards end-results and must say that I have not seen so far any relapse of hydrocele after the careful performance of any of these radical operations. For uncomplicated cases of hydrocele we can look for no better, quicker or safer operation than the eversion method.

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THE NATURE OF DISEASE.

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There is difficulty in giving a clear idea of what is meant when we speak of disease although every individual has a concept of the word when applied personally. In a way, the difficulty might be met by simply regarding disease as the negation or opposite of the normal, but the same difficulty applies to the definition of normal. The trouble is in giving a definition which will apply to the species when all our concepts of the conditions are formed from individual experience. It is possible to conceive a normal type of a species by taking the average of weights and measurements at definite ages and the average or usual reactions which the living material exhibits under the influence of external conditions. The structural or anatomical normal type is easier to construct than the physiological or functional, although no two individuals have ever been found in whom all of the compara-